

CLAIMS

1. A method of forming coatings of at least two different coating molecules on at least two electrodes, the method comprising:
 - 5 (a) providing an array of at least two individually-addressable electrodes,
 - (b) allowing a layer of a masking molecule to adsorb onto all electrodes,
 - (c) inducing electrochemical desorption of the masking molecule from at least one but not all electrodes to expose a first set of exposed electrodes,
 - (d) allowing a first coating molecule to adsorb onto the first set of exposed electrodes,
 - 10 (e) exposing all electrodes to a masking molecule to allow adsorption of the masking molecule onto all electrodes,
 - (f) inducing electrochemical desorption of masking molecule from a second set of electrodes to expose a second set of exposed electrodes,
 - 15 (g) allowing a second coating molecule to adsorb onto the second set of exposed electrodes.
2. A method according to claim 1 in which the array comprises at least 10, preferably at least 50 individually-addressable electrodes.
3. A method according to claim 1 or claim 2 comprising repeating steps (c) to (e) at
20 least 8 times so as to form coatings of at least 10 different coating molecules on at least 10 different sets of electrodes.
4. A method according to any preceding claim in which the diameter of each electrode is not more than 50 μm , preferably not more than 900 nm, more preferably not more than 500 nm.
5. A method according to any preceding claim in which the separation between
25 electrodes is not more than 30 μm , preferably not more than 900 nm, preferably not more than 100 nm, more preferably not more than 50 nm.
6. A method according to any preceding claim in which the electrodes are metal electrodes and the masking molecules and the coating molecules are thiolated.
7. A method according to any preceding claim in which the coating molecules are
30 macromolecules having molecular weight at least 500, preferably at least 1000.
8. A method according to any preceding claim in which the coating molecules are oligonucleotides modified with a functional group capable of adsorbing onto the electrodes.

9. A method according to claim 8 additionally comprising providing nanoparticles functionalised with oligonucleotides complementary to the oligonucleotide coating molecules and allowing the strands to hybridise.
10. A method according to any of claim 1 to 6 in which the coating molecules are polypeptides modified with a functional group capable of adsorbing onto the electrodes.
11. A method according to any preceding claim in which step (b) and/or step (d) also comprise application of an AC or DC electric field in order to induce orientation of the molecules being adsorbed.
12. A method according to any preceding claim comprising controlling the potential of electrodes from which desorption is not required in steps (c) and/or (f) so as to prevent desorption from those electrodes.
13. A method according to any preceding claim comprising application of an AC or DC potential to the electrodes onto which adsorption is required in step (b) and/or step (e) and/or step (g).
14. An array of at least 3, preferably at least 5, more preferably at least 10 sets of individually-addressable electrodes, each set having adsorbed thereon a different coating molecule, the minimum distance between electrodes being not more than 900 nanometres, preferably not more than 100 nanometres, more preferably not more than 50 nanometres.